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Government
Publications



CUESTA



Minister's Greetings

As a Cuesta reader for several years I am delighted and proud as Minister responsible for the Escarpment to extend greetings to all other Cuesta readers. I find that each issue brings me new appreciation of the escarpment's geology, history and beauty.

In June 1990, the Ministry of the Environment became host ministry to the Niagara Escarpment Program. Around the same time, the Escarpment and the Niagara Escarpment Plan received well-deserved international recognition as a United Nations

Educational Scientific and Cultural Organization (UNESCO) Biosphere Reserve.

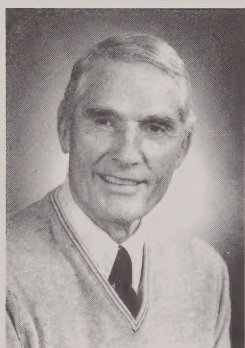
This is a tribute to the Escarpment's wondrous environment and to the people who support the Plan's wise approach to conservation and preservation in this unique and precious area of the province.

In 1992, I will be taking a very close look at our record of conserving and preserving the Escarpment when I consider the Niagara Escarpment Plan Review.

The review marks the fifth anniversary of the Plan and is therefore an opportunity to examine our accomplishments, and shortcomings, in light of several years of experience. I look forward to reporting to you at its conclusion.

For now, my sincere best wishes to Cuesta readers.

Ruth Grier, Minister of the Environment



Chairman's Message

"If you expect to see the results of your efforts you haven't asked a big enough question."

This observation by journalist and social critic I.F. Stone translates nicely to our experience with the Niagara Escarpment.

Almost 20 years ago, the people of Ontario posed a difficult question: "How do we preserve the Niagara Escarpment." After much give and take, the answer in 1985 was the Niagara Escarpment Plan.

The short term results of implementing the plan are largely positive.

Development control, the plan's main mechanism, has proved to be a fine tool for ensuring the environmental compatibility of human activity along the Escarpment.

The parks system has grown and the Bruce Trail is steadily coming into its own as a permanently secured walking path along the Escarpment.

The Escarpment has gained international significance as a Unesco World Biosphere Reserve. Other jurisdictions are studying us to see how our version of sustainable development might be applied in their situations.

In the past year we were approached by people from British Columbia's Gulf Saanich Islands and a regional nature reserve in northern Latvia. We were invited to

discuss environmental land use with representatives from France, Germany, Italy and Spain — the Four Motors of Europe.

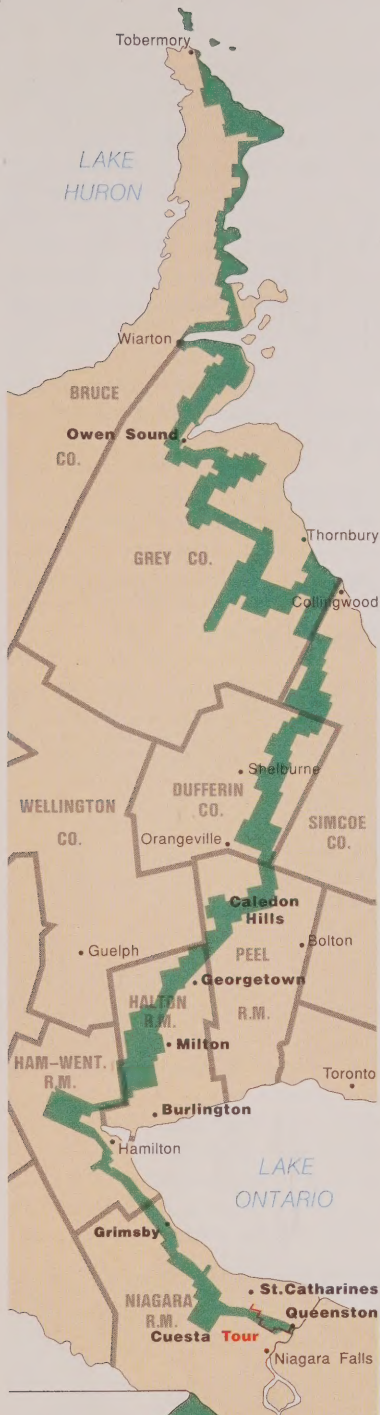
Closer to home, we provided input to the Greater Toronto Area Greenlands Strategy and the current Commission on Planning and Development Reform in Ontario.

Were these the results we were looking for? Yes and no. Our accomplishments are rewarding and the opportunity to share our experience with others is gratifying. Yet there is still so much to do.

Environmental monitoring, research, education and fund-raising are several areas where activity is just beginning. This, and our current work, must all be done economically in the spirit of restraint that we have come to accept personally and as taxpayers.

Will our efforts result in the preservation of the Niagara Escarpment for generations to come? That's an awfully big question. But the answer is yes, given time and patience.

G.H.U. (Terk) Bayly
Chairman, Niagara Escarpment Commission



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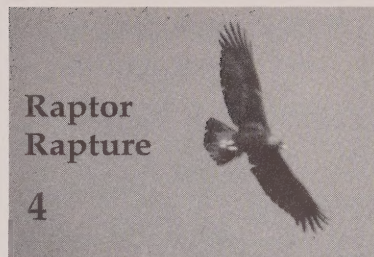
Ontario's Niagara Escarpment stretches 725 km from Queenston, near Niagara Falls, to Tobermory, at the tip of the Bruce Peninsula. It was formed 450 million years ago along the shore of a shallow tropical sea that covered a vast area of Ontario and Michigan. Skeletons of primitive sea creatures and debris from ancient mountains were compressed into massive layers of reef and sedimentary rock. Over succeeding millions of years, erosion from glaciers, ancient rivers and lakes, and the elements sculpted the rock layers into their present form.

The Niagara Escarpment and lands in its vicinity — 183,000 hectares in eight counties and regions and 37 local municipalities — are regulated by the Niagara Escarpment Plan. Adopted by Ontario in 1985, it is Canada's first large-scale environmental land-use plan. The plan ensures that the Escarpment will be maintained substantially as a continuous natural environment. It strikes a balance between conservation, protection and environmentally compatible development.



This issue of Cuesta is dedicated to Ivor McMullin and John Alexander.

♻️ This paper stock contains 10% post-consumer waste & 50% pre-consumer waste ♻️



Raptor Rapture

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By Susan Powell

Every spring raptors migrate along Ontario's Niagara Escarpment by the thousands.

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By Richard Murzin

Ferns are one of the oldest land plants on the planet. The Niagara Escarpment in Grey-Bruce has a huge variety.

Brock's Two Monuments

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By Stephen Otto

After many false starts, a monument was finally built. Then vandals blew it up.

CUESTA Originally a Spanish term meaning flank or slope of a hill, in geological terms means a ridge composed of gently dipping rock strata with a long gradual slope on one side, and a relatively steep scarp on the other

Front cover: Detail from engraving of W.H. Bartlett's 1838 sketch of Queenston with the first Brock Monument in the distance. **Back cover:** Detail from engraving of Bartlett's "Queenston", engraved by R. Wallis, London, 1842. Both are courtesy of the National Archives of Canada.

Editor: Susan Powell • **Design & Layout:** Bob Pepper & Susan Powell • **Cartography & Reprographics:** Bob Pepper, John Novosad, Colin Mandy & Andre Delisle.

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Niagara Escarpment Commission
232 Guelph Street
Georgetown, Ontario L7G 4B1
(416) 877-5191



.....Niagara Escarpment Plan Area

NEC creates new map and geology guide



Photo by: J. Noosad

A poster and geology guide are the newest educational products for teachers and the public from the Niagara Escarpment Commission.

The poster is a stylized map decorated with selected Escarpment flora and fauna, historical sites and geological features. The picture borders are double columns of text — English or French — which enlarge on these themes.

The poster is a companion to the 250-page "Guide to the Geology of the Niagara Escarpment". In text, graphics and photographs, the book describes the geology of the Escarpment from its earliest beginnings to the present.

It includes 10 field trips with maps covering the Escarpment from the Niagara River Gorge to the tip of the Bruce Peninsula.

Review copies of the guide are being field tested by a select panel of teachers, outdoor educators and technical experts. The final version will

be ready in early 1992.

Both products are free to teachers and educational institutions. The NEC will sell the geology guide at cost to the public. 🐾

Recreational Ponds: Is the peril worth the pleasure?

Private recreational ponds may be sucking the life out of some areas of the Escarpment.

Amid reports of dried up wells and declining fish populations, the Niagara Escarpment Commission (NEC) has decided to launch a comprehensive study on the impacts of pond construction, water taking and diversions. It could be the first research of its kind anywhere.

The fractured, porous rock of the Escarpment is a major source of drinking water for south central Ontario. In Mono Township near Orangeville, for example, the Escarpment is a recharge area for the Humber, Credit, Grand and Nottawasaga River systems.

Ponds are becoming a status symbol for owners of country homes. An air photo study of an area in the Region of Peel shows 70 of them within a 34-kilometre square. Along the Escarpment, they are most common in the counties of Dufferin and Simcoe and the regions of Halton and Peel.

They are used variously as swimming holes and reflecting pools.

Golf courses use them as water hazards and irrigation ponds and they feed snow-making machines. A fellow in Halton dug a long, narrow pond so he could land his float plane.

Whatever their use, however, their cumulative effect on water quantity and quality is not well understood.

What happens when underground water is brought to the surface?

Whether it evaporates or is pumped away, the obvious impact may be someone downstream wondering why nothing comes out when they turn on the tap. The NEC study also expects to look at more subtle effects to the environment.

Ponds make cold stream habitats warmer. It's a simple fact that run-off from a pond exposed to the sun will increase water temperature downstream.

Now, it's suspected that this surface heat is also gradually transferred from the pond's surface to its underground source. This warms springs that are the heart of the Escarpment's cold streams.

There have been reports that Brook and Brown trout populations have been declining in some of these streams. This could be a by-product of warming. It could also be blamed on silt and nutrients that are flushed from ponds by heavy storms and spring run-off or during pond construction. Silt covers spawning beds; nutrients cause oxygen depletion by promoting the growth of algae. 🐾



Photo by: NEC

Recreational ponds are not natural. They are collectors for fertilizers and pesticides washed from adjoining lawns. Evaporation and surface warming may affect cold stream habitats.

The results of direct human maintenance may be quicker and more blunt.

Copper sulphate, used to kill weeds and algae in a pond, is non-selective. It will do the same thing when it leaches into a nearby wetland.

And because they tend to be part of manicured, controlled landscapes, ponds are catch basins for fertilizers, herbicides and pesticides washed from adjoining lawns and links.

Golf courses, in fact, are far and away the biggest users of water

for recreational purposes. Some large clubs draw more than 150,000 litres a day for irrigation. An average household would take about six months to use that much.

The NEC is expected to start its study in early 1992. Analysis of the research should result in new policy guidelines for the Niagara Escarpment Plan.

In the meantime, as part of its current review of the Plan, the NEC recommends a moratorium on recreational ponds until the facts are in.



Niagara Escarpment Quick Facts

- Development Permit applications processed by the Niagara Escarpment Commission in 1990-91: **1,079**
- Number of amendments to the Niagara Escarpment Plan proposed since 1985: **87**
- Number of these that proposed increased development: **69**
- Number of kilometres of trail acquired by the Bruce Trail Association, 1986-1991: **61.4**
- Average cost to secure 0.1 km of trail: **\$9,000**
- Number of waterfalls on the Niagara Escarpment: **60**
- Number of known fern species in Ontario: **70**
- Number of these found on the Niagara Escarpment in Grey and Bruce Counties: **50** (see page 12)
- Size of Niagara Escarpment compared to Ontario: **0.17%**



Dufferin Quarry Bridge closes major gap for Bruce Trail users



Photo by: Richard A. Armstrong

A footbridge spanning a chasm in the Niagara Escarpment was officially opened by the Bruce Trail Association (BTA) in May, 1991.

The 41-metre bridge looks down six storeys over Canada's largest limestone quarry. The bridge fills a major gap in the 770 kilometre Bruce Trail and creates a permanent path for trail users along the brow of the Niagara Escarpment.

This portion of the escarpment was blasted away in 1962 for a trucking road. The "notch" was visible for miles and became a rallying point for environmentalists concerned about the impact of quarrying on the escarpment.

Until the bridge was opened, the Bruce Trail was rerouted around the quarry and trail users had to de-

tour along a country road. The bridge allows for 3 km of the trail to be routed onto public land owned by the Halton Region Conservation Authority (HRCA).

The bridge cost about \$115,000. \$50,000 from the Ontario Ministry of Tourism and Recreation; \$30,000 from quarry operator Dufferin Aggregates; and the remainder from BTA members, corporations and others.

The Bridge project was initiated in 1988 by the Bruce Trail Association with Dufferin Aggregates and the HRCA.

This section of trail will eventually feature an interpretive centre with displays illustrating the escarpment's geological history.

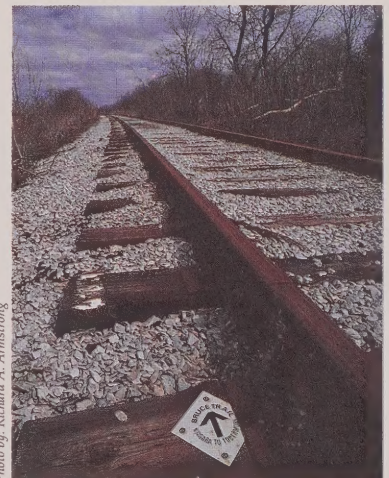


Photo by: Richard A. Armstrong



RAPTOR RAPTURE

By Susan Powell

Photos by : Barry Cherriere

One hundred pairs of binoculars point skyward and follow a Bald Eagle soaring.

It banks left and the afternoon sun sweeps over its powerful body.

They see the snowy whiteness of head and tail. Some sigh, others barely breathe, but not a word is spoken.

Just another day at the annual spring hawk migration at Beamer Memorial Conservation Area on the Niagara Escarpment near Grimsby.

Most of the hawkwatchers are novices, invited to Beamer Conservation Area by the Niagara Peninsula Hawkwatch on this Good Friday in 1991. Although they organized only in 1990, the Niagara Peninsula Hawkwatchers

have been enjoying the spring migration of raptors at this spot for at least fifteen years.

Beginning early in March and continuing every day until the middle of May, the members of the Niagara Peninsula Hawkwatch (NPH) station themselves at Beamer C.A. to count, identify and record every bird of prey that passes overhead.

Streams of hawks, eagles, falcons, and vultures move along the escarpment on their way to more northerly nesting grounds.

Red-tailed and Rough-legged Hawks form the vanguard, but by the end of March, Turkey Vultures, Northern Harriers, American Kestrels, Sharp-shinned, Cooper's, and Red-shouldered Hawks are regular passers-by. The

rarer species include Bald and Golden Eagles, Merlins, and Peregrine Falcons.

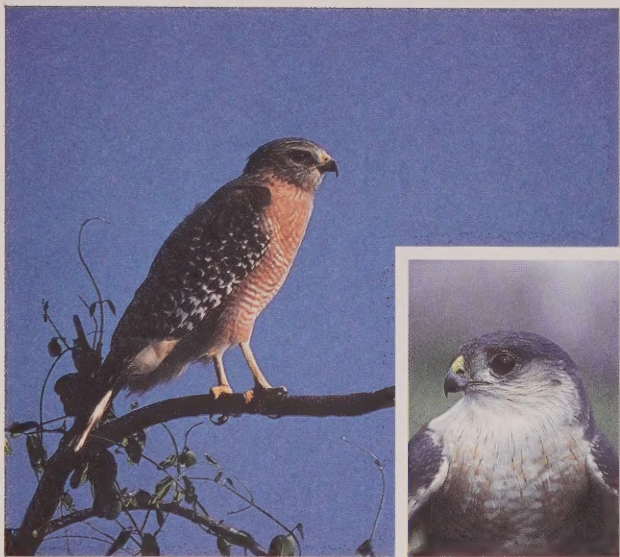
For example, throughout last year's spring migration the counters from the NPH spotted over 3,023 Red-tailed Hawks, 17 Bald Eagles, 8 Golden Eagles, 46 Osprey and 3,767 Sharp-shinned Hawks. On a good day, birders might see up to 1,000 graceful beauties winging overhead.

In spring, the cold waters of Lakes Ontario and Erie do not produce thermals. So birds of prey migrating north into Ontario go around these two bodies of water and fly directly over the Niagara Peninsula and along the escarpment at Beamer.

Along the escarpment, strong updrafts are created by



Photo courtesy: Hamilton Spectator



Opposite page: Golden Eagle; Above top left: Red-shouldered Hawk (Adult); Above top right: Red-tailed Hawk; Inset: Sharp-shinned Hawk (adult)

winds being deflected upwards as they blow against the limestone cliffs. Migrating hawks take advantage of the redirected winds and glide on set wings above the tree tops.

Says Bruce Mackenzie, Hawkwatch member and past President of the Hamilton Naturalists' Club, "The escarpment's physical structure is the reason why there is such a large concentration of hawks, vultures and other raptors throughout this area. The Beamer promontory or spur of rock in Grimsby funnels the flight of the hawks."

These birds also drift high in the sky by "catching a thermal", a column of rising hot air created by spring sunshine warming the ground. Circling inside this thermal, the birds will rise until they are mere specks, and at the top of the thermal they set their wings and glide for approximately a mile without moving a feather. Both of these effects, the updrafts and thermals, are at their strongest between 10:00 a.m. & 3:00 p.m. — peak watching hours.

Hawkwatchers gather in the parking lot at Beamer C.A. because of the good view. "Hawk

migration is a phenomenal happening. It's like a parade of the Royals" says Bruce. "And it's an opportunity to experience these very interesting species of wildlife which people seldom see at close range in an undisturbed, natural area."

Beamer Memorial Conservation Area is located on top of the escarpment. The conservation area is approximately 53 hectares and is managed by the Niagara Peninsula Conservation Authority. The Bruce Trail winds through the area where many of the lookout points are located.





Above left: Northern Harrier (adult male); Inset: Kestrel (adult-male); Above right: Cooper's Hawk (adult).

Walter Klabunde, who lives across the river in Lewiston, New York has come to Beamer since 1979.

"I began to dabble in hawkwatching around 1974. I used to go to Youngstown, New York but Beamer has the best concentration of hawks anywhere," says Walter.

"I would spend five days a week at Beamer from 8:00 in the morning until five at night, scanning the skies and tabulating the numbers. Now that I'm 84 years old I can't get around like I used to; I visit Beamer only three times a week during the spring migration."

Walter and his wife Harriette have travelled throughout the United States on many birding treks. They have been avid birders since 1946.

Visitors attending the annual Open House on Good Friday can learn about the hawk migration from a brochure and a new display board that was created by the Niagara Peninsula Hawkwatch with funding from the Ontario Heritage Foundation.

The display lists all species regularly seen and includes daily totals, season totals and highlights of the Hawkwatch. The Niagara Peninsula Hawkwatch prints the results of the Beamer count annually in a newsletter.

This information is sent to Muhlenburg College in Allentown, Pennsylvania, where the Hawk Migration Association of North America compiles data from North America and Mexico to produce a spring and fall report.

Birds of prey are marker species. They are very sensitive to toxins that build up in the food chain. When we see a decline in a particular species, we should be concerned.

Says Mackenzie, "Hawks are at the top of the food chain and are important indicators of what is happening elsewhere in the environment."

The Association analyses the data to identify species that might be in trouble. Recent data indicates that the Sharp-shinned Hawk is declining in eastern North America.

Beamer Memorial Conservation Area is located on Quarry Road in Grimsby. To reach the C.A. from the west, take the QEW Niagara to Christie Street, turn right on Christie Street and follow it straight up the escarpment (where it turns into Mountain Road) until you reach Ridge Road West. Turn right and travel for approx. 1 km. to Quarry Road. Turn right and look for the signs to the conservation area.- approx. 1 km. 📍

For more information about the Niagara Peninsula Hawkwatch and membership contact:

Niagara Peninsula Hawkwatch
c/o John Stevens
1365 Bayview Avenue, Unit 3
Toronto, Ontario.
M4G 3A5

Special thanks to Bruce Duncan for his research, enthusiasm and continued interest and dedication to the Niagara Peninsula Hawkwatch.

Susan Powell is Public Affairs Officer for the Niagara Escarpment Commission.

Exploring the Escarpment:

Welland Canal to Queenston

Where culture and commerce meet nature

Our Cuesta Tour begins in St.Catharines, the heart of wine and festival country and the location of the Welland Ship Canal, one of the world's foremost engineering marvels.

We follow Ontario's Niagara Escarpment east with visits to several natural environment parks and the prestigious vineyards of Niagara. We look into escarpment geology at Canada's oldest quarry.

Finally we visit historic Queenston Heights, where Brock's Monument marks his victory and death in battle.

Welland Ship Canal - "Lock 3" Viewing Complex in the City of St. Catharines

To reach the Viewing Centre, take the QEW Niagara (East) to the Glendale Ave. exit # 89. Go approx. 3 km; cross over Bridge # 5 and take an immediate right turn onto Canal Rd. Follow the signs and travel approx. 1 km. to the "Lock 3" Viewing Complex located on the right side of the road.

This 43 km (26 mile), waterway was built to compensate for the 100 metre difference in height between Lake Ontario and Lake

Erie. Thanks to William Hamilton Merritt, the man behind the construction of the first Welland Canal, ships over 220 metres (730 ft.) long can make their way through eight giant locks. No other canal in the world has to overcome a slope as steep and abrupt as the Niagara Escarpment.

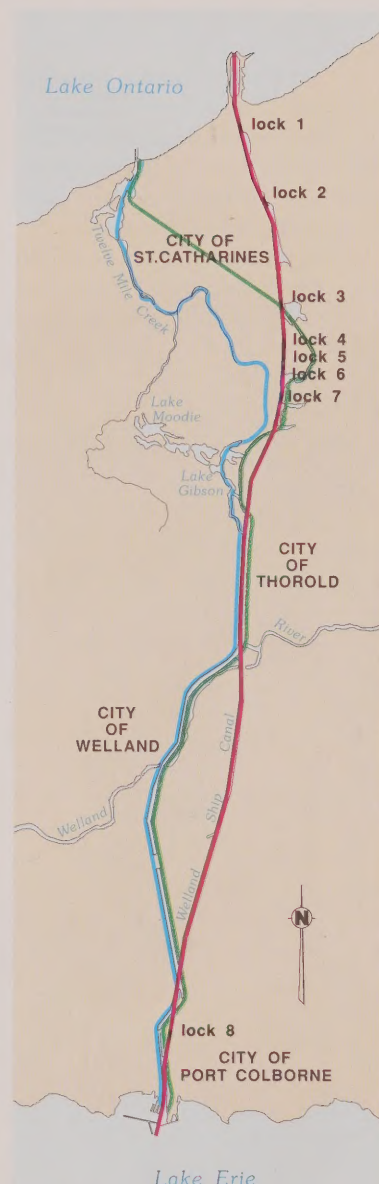
At Lock 3 Viewing Centre you can view, the opening and closing of the 261.8 metre (859') long and 24.4 metre (80') wide concrete locks that allow lakera and ocean vessels to make their way through the canal towards the Great Lakes. It takes eight minutes to fill one lock.

Inside the centre is the St. Catharines Historical Museum with galleries devoted to various aspects of pioneer life, local industry and military history. Also on display is a small scale, working model of the present Welland Ship Canal. The centre includes an information centre, gift shop, interpretive centre and dining room.

The first of the four Welland Canals was built in 1824 and opened in 1829. It climbed the face of the escarpment sideways via 39 timber locks nestled into the slope.

The second canal, with 27 stone locks, opened in 1845 but by the 1870's the canal grew obsolete as ships were built bigger and could no longer fit through the canal.

The third canal was built in 1887 and with the introduction of



The Welland Ship Canals

First and Second Canal.....
note: differences between 1st
and 2nd are not shown.
Third Canal.....
Fourth Canal.....

CUESTA TOUR

electricity, the 26 stone gates were electrically powered.

Today's Welland Ship Canal opened in 1932 and was one of the first canals in the world to be lit from end to end (1951). The St. Lawrence Seaway Authority presently looks after the canal.

Portions of the historic old canal can be seen by hiking, biking

and walking along the Merritt Trail at Mountain Locks Park or on the Bruce Trail.

Viewing Centre to Woodend Conservation Area (C.A.)

As you leave the centre, turn left on Canal Road and head south 1 km. to the stop light.

Turn left onto Glendale Ave. and continue east across Bridge # 5. Drive for approx. .5 km. Look to your right and you will get a good view of the old Welland Canal (3rd) located on the south side of Glendale Ave.

Continue for approx. 1.5 km until you reach Regional Road # 70. Turn right and head south for approx. 1 km. until you reach the Woodend C.A., located on the east side of the road.

Woodend Conservation

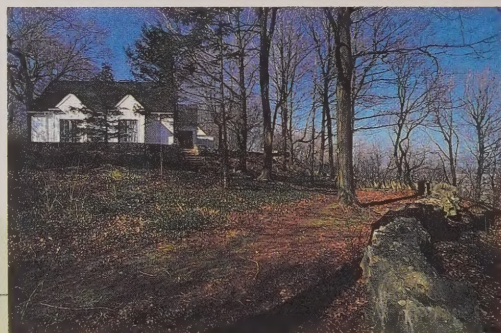
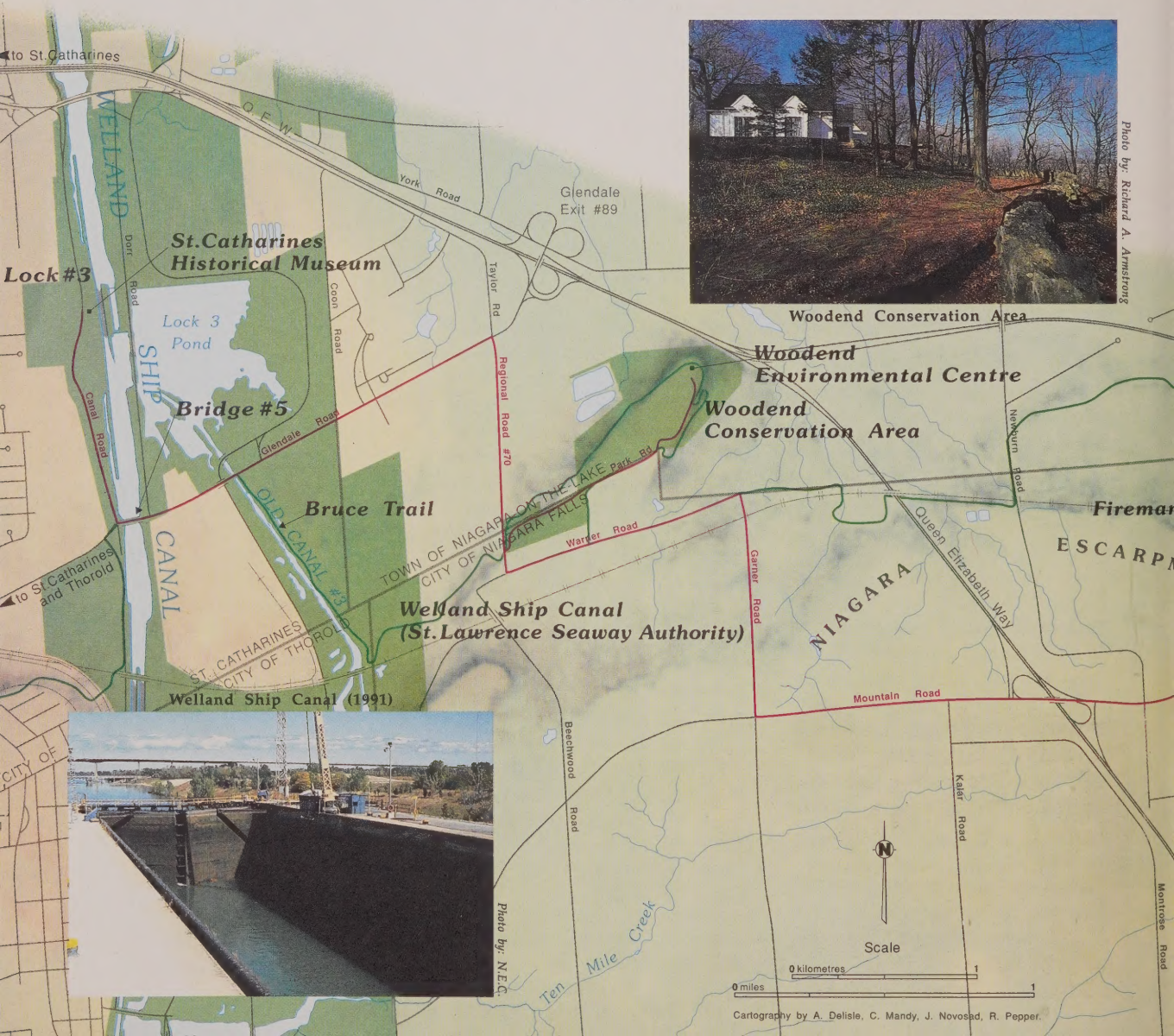


Photo by: Richard A. Armstrong

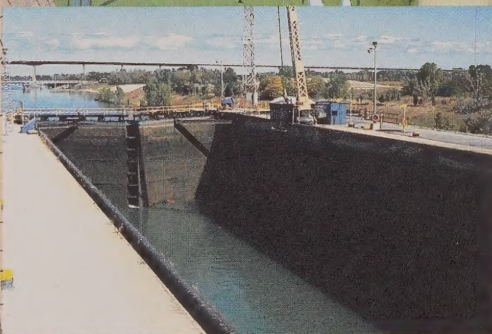


Photo by: N.E.C.

Area is one of over 100 parks in the Niagara Escarpment Parks System and is operated by the Niagara Peninsula Conservation Authority (NPCA).

This 45 hectare (112 acre) escarpment natural area contains three trails; the Bruce Trail the Hardwood Trail (NPCA) and the Silurian Trail (NPCA).

Woodend C.A. and the estate building located on the property is the site of the "Woodend Environmental Centre" for students from the Lincoln County Board of Education.

*Woodend C.A. to
Fireman's Park*

As you exit the conservation area, turn left (south) onto Regional Road # 70 and then make an immediate left turn onto Warner Road. Continue east on Warner Road for 1.3 km.

Note: to the right and left of the road are many of the privately owned vineyards in the Niagara area.

Turn right on Garner Road and continue for 1 km until you reach Regional Road #101 or Mountain Road. Turn left or east and follow Mountain

tain road for approx. 3 km to Fireman's Park.

As you travel along Mountain Road, look to the north. If it's a clear day, you can see across Lake Ontario to Toronto. Fireman's



Park is located on your left, off Dorchester Road. There are two entrances to the parking areas; one directly off Dorchester Road, immediately on the left and the other is located at the end of Dorchester Road on the left, just over the railway tracks.

Fireman's park is owned and managed by the Stamford Centre Volunteer Fireman's Association (SCVFA) and the City of Niagara Falls.

Over 30 years ago a portion of this 40 hectare (100 acres) park was used as a landfill by Ontario Hydro. The Fireman's Association acquired the park and developed it for passive use, picnicking and hiking.

The Bruce Trail runs through the north end of the park, through escarpment natural and protection areas. A fishing pond is also located at this end of the park. On a clear day you can see across Lake Ontario to Toronto and Mount Nemo in Halton.

In 1989 the SCVFA received a Niagara Escarpment Development Achievement Award for developing the park to compliment and emphasize the natural characteristics of the escarpment.

Fireman's Park to Queenston Quarry

As you leave the park **turn left (east) onto Regional Road # 101 and travel for approx. 1 km until you reach a stop sign at Regional Road #100 (St. Paul's Ave.)**

Turn left or north on this road. Keep an eye out for a large stone cairn located on the left side of the road.

This cairn marks the site of a large Indian Ossuary or mass grave. It's presumed that the bones belonged to Indians of the Neutral Iroquoian Confederacy. The In-

dian burial pit was first discovered in 1820 and looted in 1908.

The cairn also makes reference to a "Stamford Cottage", summer home to Sir Peregrine Maitland, Lieutenant-Governor General of Canada in 1818. He owned 51 acres of land on the north west corner of Portage Road and Mountain Road on the brow of the escarpment.

until you reach the stop sign. As you drive along this road, the Queenston Quarry (Steetley Industries Ltd.) is located on the left.

The Queenston Quarry has been in operation since the 1830's as a source for limestone and crushed stone.

In 1987, about 40 hectares of the quarry property was partly



Photos by: NLC

Above: Hiking on the Bruce Trail at Queenston Quarry, looking north east; Inset: Old Welland Canal at Mountain Locks Park.

The original cottage burned and was replaced; a rail line was laid in; a sand pit was expanded and all evidence of the home is gone.

Continue on Regional Road # 100 for approx. 1 km. until you reach Townline Road. Turn right or east on Townline Road (Regional Road # 61) and continue on the road for approx. 1 km.

donated by Queenston Quarry (Steetley Industries Ltd.) and partly purchased by the Niagara Parks Commission. This portion of the property is located on the north side of the quarry.

If you walk along the Bruce Trail you'll have a great view of cities located to the north across Lake Ontario and portions of the quarry now being restored.

If you wish to access this portion of the trail, turn left at the stop sign, and continue east for approx. 1.4 km on Portage Road. Turn into a small parking area located on the north, left side of the road. The Bruce trail is identified by white markers on the trees. It is approx. a 10 minute walk to reach the look out point.

If you do not wish to stop at

Queenston - "A Lesson in Canadian History and Geology"

On October 13, 1812 the escarpment above the Village of Queenston resounded with musket and cannon fire as British and militia forces engaged invading American troops in the struggle for a nation.

the Niagara River.

Originally called West Landing, Queenston was an important portage point to Lake Erie before the Welland Canal by-passed Niagara Falls.

When you walk around Queenston be sure to visit Laura Secord's house on Partition Street, William Lyon Mackenzie house, and Locust Grove Park where you can see one of the best examples of the layered escarpment bedrock (see map for locations). At this point you are below the Horseshoe falls looking south at the eleven km Niagara Gorge.

Geologists estimate that 35,000 years ago Niagara Falls was 11 kilometres downstream from its present position. Following the last withdrawal of glaciers, an ancestral Niagara River poured over the rim of the Niagara Escarpment just above the site of Queenston. The cascading waters eroded the great gorge causing the falls to recede from the edge of the escarpment at Queenston to their current position.

This completes the tour of the Niagara area. **Total distance is 18.8 km.** 📍

• • • •

If you go south...

Although our tour does not take us into Niagara Falls, it is only 10 km. south of Queenston.

If you go north...

The Town of Niagara-on-the-Lake is located approximately 11 km north of Queenston.

Note: If you're with a group of people please think about travelling in one car. Hiking and biking around the area is recommended. For bus tours contact Ontario Tourism Centres or the local Chamber of Commerce.



Above : The Niagara River at Queenston Heights; Inset: Bruce Trail cairn, Southern Terminus.

this access point, continue east on Portage Road (# 102) for another 1.8 km until you see the signs to Queenston Heights and Brock's Monument located on the left side of the road. The Niagara Parks Commission owns and manages the 56 km (35 miles) of parkland along the Niagara River from Fort Erie to Niagara Falls.

During the Battle of Queenston Heights Major-General Sir Isaac Brock, the commander of the British military forces, was killed by a 15-year-old American sharp-shooter as he led a charge up the escarpment to regain a captured battery.

The Niagara Parks Commission preserves and interprets Canadian historical resources along

Photos by - NLC

Graceful Greenery

By:

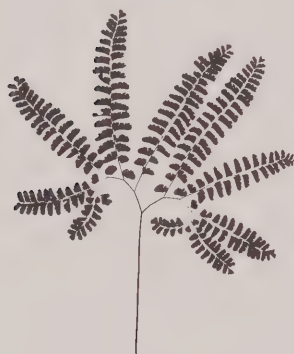
Richard Murzin

Photos by:

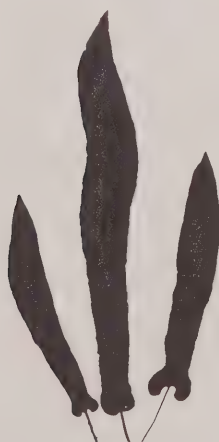
Nelson Maher



FRAGILE FERN
(*Cystopteris fragilis*)



MAIDENHAIR FERN
(*Adiantum pedatum*)



HART'S TONGUE FERN
(*Phyllitis scolopendrium*)

Ferns are one of the oldest land plants on the planet. Fossil remains have been found in rocks 350 million years old.

Hence we all think we know what a fern looks like. Its name denotes anything green and feathery, an image carried from Greek where "pteros" is feather and "pterus" is fern.

Yet they are not always feathery and there are vast differences between them according to species. Primitive survivors they may be, but survival for each is dependent on a critical blend of temperature, moisture, light and soil composition.

There are more than 10,000 species of ferns in the world, mostly in the tropics but as far north as the Arctic circle. Ontario has about 70 species and the Grey-Bruce area has about 50 of those.

The predominance of the Niagara Escarpment in these counties has something to do with that.

Owen Sound naturalist Nelson Maher, who has hunted and studied ferns for 35 years, has identified 38 in his area, 29 within the city limits.

"I have looked for ferns while camping in more than 70 provincial parks and in national parks from the east coast to Vancouver Island," says Nels.

"The escarpment's recognition as a world biosphere reserve means a lot to a fern lover," he says. "There's hope that this green belt will be preserved, and with it, the greatest concentration of ferns anywhere in Canada."

And so it will remain if we let it alone, because the escarpment's alkaline limestone assures



Maidenhair Fern

Photo by: S. Powell



Fiddleheads of a Christmas Fern



Holly Fern



Cinnamon Fern



Robert's Fern



Hart's-tongue Fern

a ripe habitat for ferns.

As well, the range of micro-environments here has led to an incredibly diverse fern population in a compact area. In some cases, two species within a few metres of each other couldn't trade places and live, so rapid are the changes in conditions.

The Slender Cliffbrake (*Cryptogramma stelleri*) enjoys the dank shade of a rock crevice, its roots moistened by a steady trickle of water. Its cousin, the Smooth Cliffbrake (*Pellaea glabella*), prefers the quick drainage and open air of a sunny cliff. The escarpment has both settings.

The Wall-rue (*Asplenium ruta-muraria*) is very picky about where it puts down roots. Hope Bay and Flowerpot Island on the Bruce Peninsula are two of the four places in Canada where you might see it. (The other two areas are Manitoulin Island on the top of the "Cup and Saucer" trail and Quebec's eastern townships.)

Along the escarpment, hike the Georgian Bay Trail in Bruce Peninsula National Park and look above the caves.

You may need a field guide to identify it once you get there because the wall-rue doesn't fit the common image of fern.

This is true also for the Hart's-tongue (*Phyllitis scolopendrium*), so named because someone thought it resembles a deer tongue.

That kind of imagery of common names can be helpful in identifying ferns. The Cinnamon Fern (*Osmunda cinnamomea*) sprouts a tall central stalk the same tawny brown as the tropical spice. The stems of the leaves of another fern look like black hairs, hence, the Maidenhair Spleenwort (*Asplenium trichomanes*).

The Walking Fern



OSTRICH FERN
(*Matteuccia struthiopteris*)



OAK FERN
(*Gymnocarpium dryopteris*)



LEATHERLY GRAPE FERN
(*Botrychium multifidum*)



CHAIN FERN
(*Woodwardia virginica*)



CHRISTMAS FERN
(*Polystichum acrostichoides*)



WALKING FERN
(*Camptosorus rhizophyllus*)



MAIDENHAIR SPLEENWORT
(*Asplenium trichomanes*)



RATTLESNAKE FERN
(*Botrychium virginianum*)

(*Camptosorus rhizophyllus*) takes one "step" a year by sprouting a new plant when the tip of a frond touches a mossy rock. (The Bruce Trail Association aptly adopted the walking fern as its botanical emblem.)

It was a keen observer who named the Chain Fern (*Woodwardia virginica*). It's not until you flip over a frond that you can see that the spore patterns on the underside are linked.

It takes two years from spore to visible fern and then the plant can be expected to live up to 50 years. Some spread from the root via underground runners and others develop in a crown, forming a hummock.

In Ontario, most are seasonal perennials. Their shoots, appropriately named fiddle heads, are visible in the fall, curled and ready to unfold in spring.

The fiddle heads of the Ostrich Fern (*Matteuccia struthiopteris*) are considered a delicacy although some people are allergic to ferns and a few ferns contain poisons and carcinogens.

"Animals don't seem to feed on them much unless foliage is very scarce," says Nels, which sounds like a good cue to steer clear.

Despite this, historically ferns have cured a variety of human ills. For example, the Male Fern was used to expel stomach and intestinal worms. Others were used to heal lung complaints and bowel disorders and treat bruises, burns, ulcers, bites and stings. 🐍

Special thanks to Nelson Maher who provided the contact prints which were taken from his "Fern Hike Check List" and most importantly for his inspiration and continued interest and research of ferns in the Grey-Bruce area.

Richard Murzin is the Manager of Public Affairs - Niagara Escarpment Commission



Smooth Cliffbrake



Slender Cliffbrake



Photo by: Willy Waterton

Above: Nelson Maher searching for ferns at one of his favourite spots, Black's Park, Owen Sound, "Fern Capital of Ontario".

Brock's Two Monuments

Major-General Sir Isaac Brock died on October 13, 1812 while leading his troops against more than a thousand Americans who had crossed the Niagara River early that morning and seized the heights above Queenston.

Mourned as a great hero, he was credited with gaining the upper hand soon after war broke out by capturing Michilimackinac and then Detroit. The latter victory convinced Upper Canadians their cause was far from lost and boosted morale.

The British Parliament erected a memorial to Brock in St. Paul's Cathedral and *The Times* compared him to Leonidas, the Spartan king slain defending the Pass of Thermopylae. Upper Canada's Legislature was not satisfied to leave things at that. In March 1814 it voted £500 for the province's own monument on

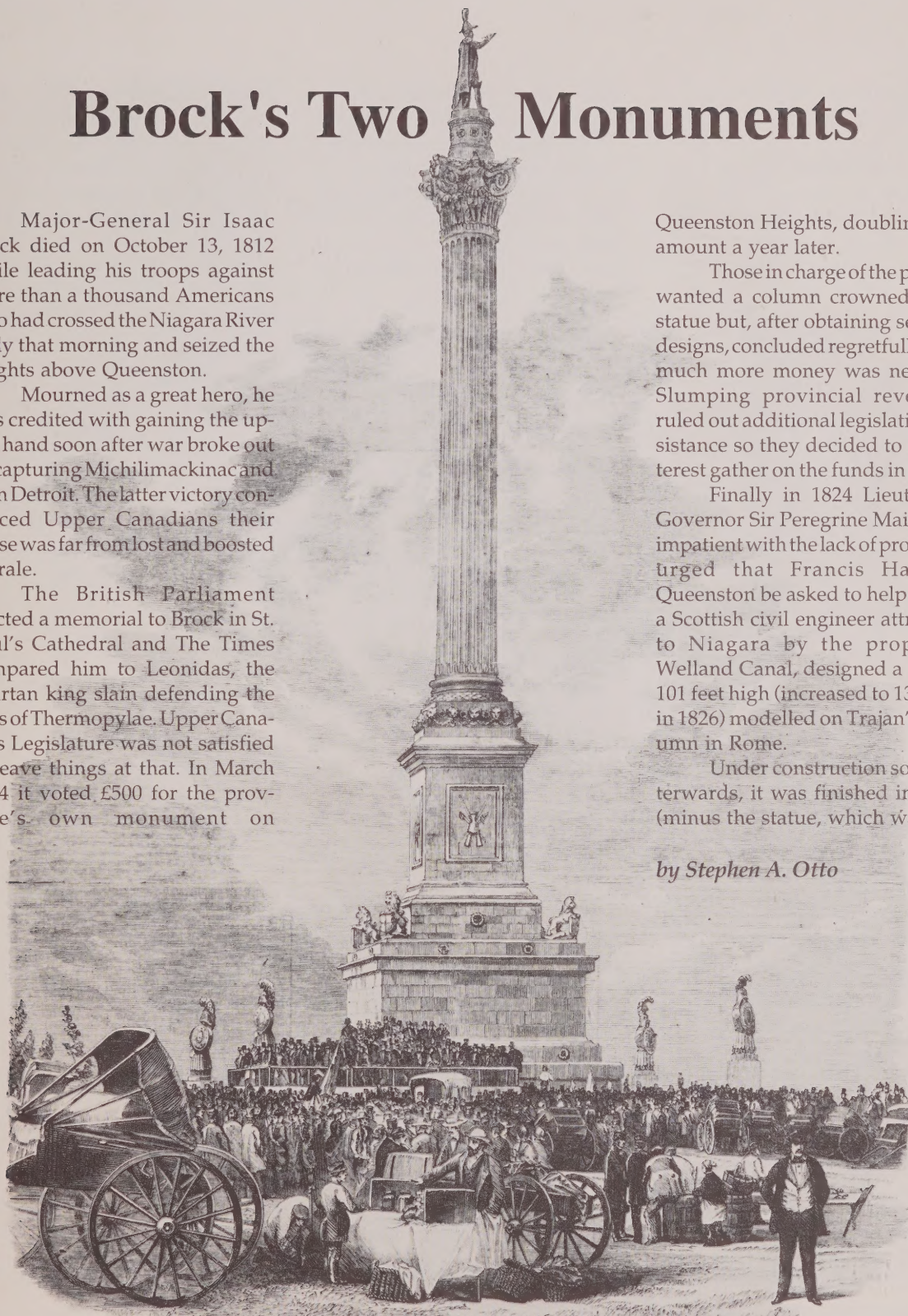
Queenston Heights, doubling the amount a year later.

Those in charge of the project wanted a column crowned by a statue but, after obtaining several designs, concluded regretfully that much more money was needed. Slumping provincial revenues ruled out additional legislative assistance so they decided to let interest gather on the funds in hand.

Finally in 1824 Lieutenant Governor Sir Peregrine Maitland, impatient with the lack of progress, urged that Francis Hall of Niagara by the proposed Welland Canal, designed a tower 101 feet high (increased to 135 feet in 1826) modelled on Trajan's Column in Rome.

Under construction soon afterwards, it was finished in 1827 (minus the statue, which was de-

by Stephen A. Otto



The Illustrated London News published a photograph by Robert Milne of Hamilton taken on the day in 1859 when the second Monument was dedicated. (Fisher Library, University of Toronto, ILN, Nov. 26, 1859). (III.2)

leted as an economy) at a cost of over £2600. Laura Secord was the first Keeper.

The monument stood a fateful thirteen years until 1840 when it was shattered by an explosion. (III.I). Those responsible for the vandalism fled to the United States

and were never identified or convicted. The incident was a sore point for several years between Canada and its neighbour.

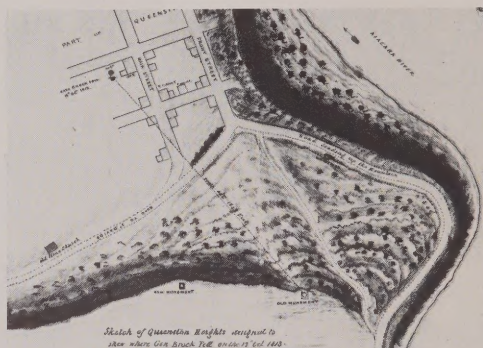
Since the structure was beyond repair a competition to design a new monument was held. A remarkably large number of en-

tries — thirty five in all — were received. First prize was awarded to an Egyptian-style obelisk by Thomas Young of Toronto. Again, however, a shortage of funds forced construction to be postponed.

By 1852 public opinion



Major-General Sir Isaac Brock

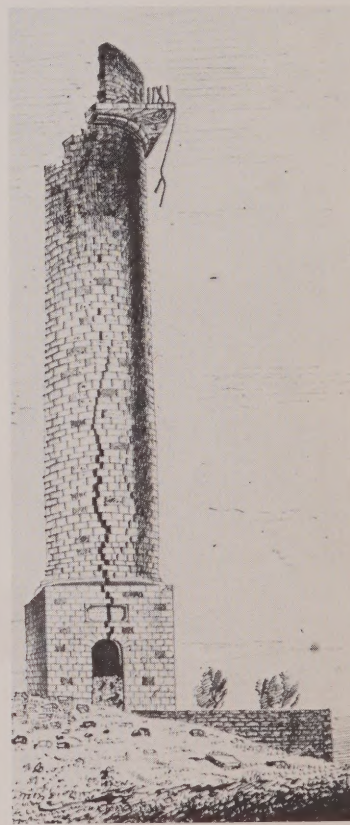


Sketch of Queenston Heights original to show where Gen. Brock fell, Nov. 13, 1812.

Courtesy: Ontario Archives



Courtesy: Norman Photographic Archives, McCord Museum of Canadian History



Courtesy: Ontario Archives

Above: Brock's Monument, Queenston Heights - 1901; **Top right inset:** An 1860 plan of Queenston Heights by George Keefer shows the locations of the first and second monuments. (OA, Merritt Papers, Pkg. #8, item 26) (III.3); **Above right inset:** This sketch by Major Thomas Glegg shows the first Monument after it was blown up in 1840. (OA S-12404) (III.1)



The monument stood a fateful thirteen years until 1840 when it was shattered by an explosion.

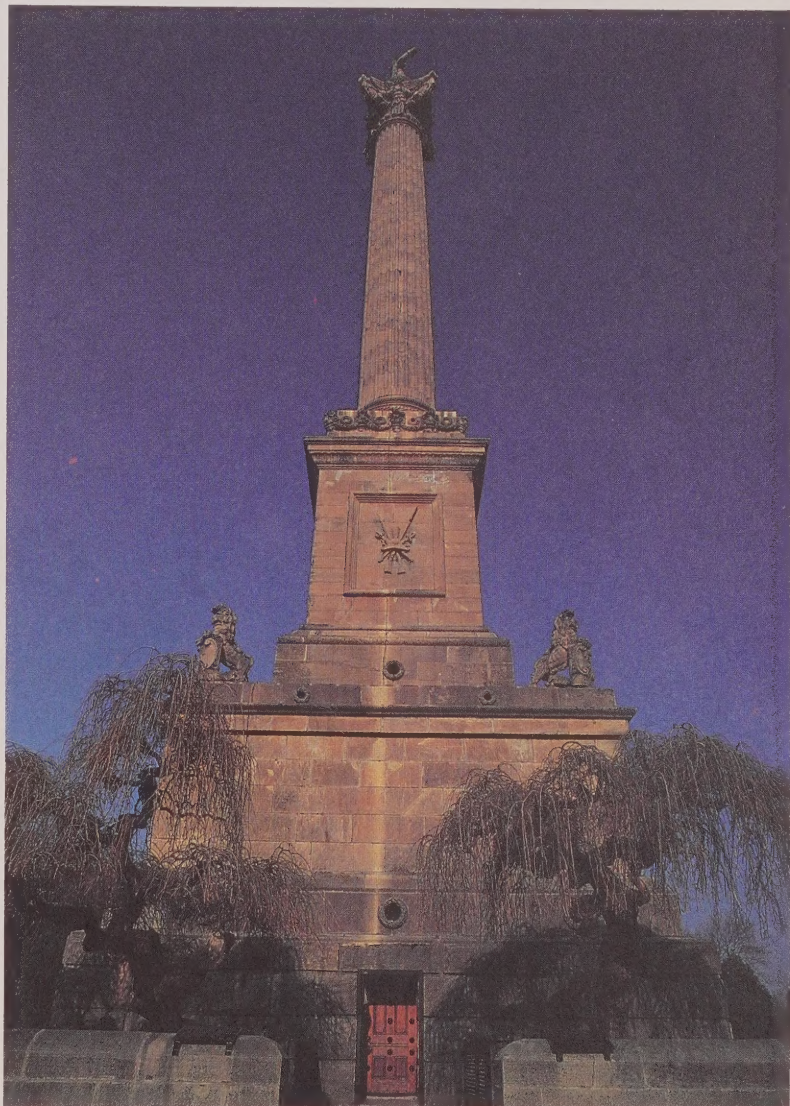
would tolerate no further delay. Meanwhile Young's design had lost favour for sacrificing the pleasures of a view to concerns for security; it contained no stair or lookout. Another competition (boycotted by most architects) was held; it attracted only seven entries.

Happily this small field included at least one design of surpassing excellence; the winning proposal by William Thomas of Toronto for a fluted column 'of the Roman Composite Order' on a high pedestal rising to a square capital formed by four sculptures of Victory and surmounted a colossal statue of Brock, his left hand on his sword and right arm outstretched. (III.2). At 185 feet, it was taller than any ancient or modern column except Wren's London Monument to the 1666 Fire. The ruins of the first tower were taken down in 1853 and the cornerstone for its successor laid two hundred yards further west. (III.3) John Worthington of Toronto was the

builder; David Cochrane and Robert Pollock, also of Toronto, were responsible for the stone carvings. (III.4). Construction on the second monument was completed in 1856. It took another three years to lay out the forty acres of surrounding grounds to plans by William Mundie of Hamilton, the province's leading landscape gar-

dener, to build the Keeper's cottage. The inauguration took place in 1859.

Today, more than a hundred and thirty years later, Brock's Monument continues to stand sentinel-like above the bold scenery of the Niagara Escarpment, reminding Canadians of their proud heritage.



Above left: One of the military trophies carved in stone at a corner of the dwarf wall surrounding the second monument. (III.4), (OA, Eric Arthur colln. 61-D-3/3). *Photo Courtesy: Ontario Archives. Above:* Brock's Monument as it stands today in Queenston Heights. *Photo by Richard A. Armstrong*

Stephen A. Otto is a Consulting Historian in Toronto. He is doing a book on the building and architecture of Ontario prior to 1918.

